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POTATO VINE LIFTER

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AGRICULTURAL EXTENSION SERVICE
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POTATO VINE LIFTER

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Experiments in many states have shown that continued spraying or dusting of the potato plants with copper compounds throughout the growing season to prevent blight will prolong the period for foliage growth. The longer the foliage is maintained, the larger the production of tubers. Late spraying is essential to the control of late blight rot.

Early in the season, the plants can be sprayed without difficulty, but late in the growing season the vines become large and fall over into the space between the rows. Unless some method is used to move the vines from the path of the wheels of the spraying equipment, the damage done to the vines by the wheels will offset a large part of the benefits from the spraying. If suitable vine lifters are used to move the plants aside as the spraying equipment is moved through the field, the spray can be applied without appreciable damage to the plants.

Several vine lifters have been devised. Two or three commercial lifters are available. The picture near the end of this pamphlet shows a home made vine lifter mounted on a tractor. This lifter works quite satisfactorily and can be built by the grower himself or by the local blacksmith or mechanic at a nominal expense.

The plans included at the end of this pamphlet are for a vine lifter similar to the one shown in the picture. The plans are general since most tractors or sprayers to be fitted will be different. The builder must adapt these plans to fit the vine lifter to his own tractor.

The bill of material is for the lifter shown later, and the prices are considered nominal. They will probably vary slightly in different communities. The material listed should be adequate to build a vine lifter to fit any row crop tractor. However, since each tractor presents a separate problem, it is possible that additional material may be required in some cases, and the builder should check this possibility before the materials are purchased. In many cases the farmer will be able to obtain the necessary material from the junk pile or from discarded machinery. If this is done, the exact sizes of members as listed in the bill of materials may not be available. The farmer must use his own judgment in substituting different sized members for those specified here.

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BILL OF MATERIALS

2 Sheets 22 gauge galv. sheet metal (30" x 96") -------	$ 3.00
48' x 3/8" x 1½" flat iron bar ----------	4.05
16' x ¼" x 1¼" flat iron bar ----------	.80
8' x 3/8" x 3" flat iron bar ----------	1.35
18" x ½" x 2" flat iron bar ----------	.25
4' x 1/8" x 5" flat iron bar ----------	.45
10' x ½" round bar ----------	.30
7' x 1" galvanized pipe ----------	.70
5' chain (5/32" dia.) ----------	.28
4 doz. ¼" x ½" stove bolts ----------	.15
1 doz. 3/8" x 2" machine bolts ----------	.20
2 doz. 3/8" x 1½" machine bolts ----------	.15
½ doz. ½" x 2" machine bolts ----------	.15
	$11.83

SHIELDS:

The shields are built of the following materials: Two side bars of 3/8" x 1½" flat iron extending from the point of the shield to the point of attachment at the axle. A brace made from the same size bar is placed between the two side bars horizontally across the shield about 2 to 3 inches in front of the wheel. (See Fig. 2.) The side bars should be spaced far enough apart to allow 2-inch clearance on each side of the wheel, and long enough to allow 3-inch clearance between the front of the wheel and the rear of the shield.

An arched ¼" x 1¼" iron bar (Fig. 3) is bolted to these side bars to support the rear of the shield. The arch is 24 inches high.

A shoe (Fig. 4) with a sole of 1/8" x 5" x 16" steel and a ½" x 2" x 6" piece set on edge and welded to the sole is bolted between the front ends of the side bars. The shoe carries the weight of the shield while the machine is in the field. About 2 inches of the point is turned up to form a sled runner to carry the shield over solid objects encountered in the field.

The framework described above is covered with 22-gauge galvanized sheet metal (Fig. 5). The sheet metal layout shown here is for a frame 16 inches wide and an arch 24 inches high. A frame with these dimensions should be satisfactory for the rear wheels of any tractor, since the width of the rear wheel is seldom more than 12 inches. Since the common width of sheet metal sheets is 30 inches, the length along the top of the shield should be limited to 30 inches. The length along the bottom should be 36 inches for the rear wheels. If the tractor has a single wheel in front, the shield may be made smaller; a shield 30 inches along the bottom, 24 inches along the top, and with an arched frame for the rear of the shield 12 inches wide and 20 inches high will be satisfactory. If the tractor is equipped with double wheels in front, the shield should be 36 inches along the bottom, 30 inches along the top, and the rear arched frame 24 inches high and about 18 inches wide. (The rear of the shield should be wide enough to allow 2-inch clearance between the side of the wheels and the side bars of the shield.)

METHOD OF ATTACHING SHIELDS:

Rear wheels -- The outside bar can be attached at a point in line with the center of the axle by means of steel straps bent to allow plenty of side

clearance and bolted to the hub of the wheel as shown in figure 1. If the straps cannot be attached to the hub, it may be possible to attach them to the rim lugs.

The inside bar can either be bolted to the housing or frame near the axle, or a sleeve can be placed over the axle and the side bar attached to the sleeve. If a sleeve is used, it should be at least 3 inches long.

Front wheels -- If the tractor has only one wheel in front, the shield may be attached as shown in figure 1. If double wheels are used in front, the side bars must be attached to the hubs of the wheels. This may be done by means of straps as shown for the rear wheel (Fig. 1.). The straps should be bowed to allow sufficient clearance between the side of the wheels and the side bars of the shields; the straps may be bolted to the wheel at the hub, or in some cases it may be necessary to bolt the straps to the rim lugs. The front shield should be attached so that it turns with the front wheels.

LIFTING DEVICE:

Rear shields -- The rear shields may be raised for transporting by means of a 1-inch pipe (the pipe is used as an axis or shaft) with 10-inch arms of $1\frac{1}{2}$" x 3/8" flat steel welded to the ends and attached to the shield by chains (see Fig. 1). The pipe is supported by 3/8" x 3" flat bars which are bolted to the frame of the tractor. The pipe is kept from sliding end ways by collars inside the vertical supports. A third arm set at about 90 degrees to the end arms and in line with the lifting lever for the cultivating attachment may be attached to the 1-inch pipe by means of a pin through the arm and pipe, by clamping the arm securely to the pipe, or the arm may be welded to the pipe. The arm should be approximately 10 inches long. This arm can be connected with the lifting lever with $\frac{1}{2}$-inch round bar. When the lever is manipulated, the pipe rotates thus raising or lowering the arms and the shields.

Front shield -- The front lifting device shown in the picture does not work satisfactorily because the lifting force is not applied vertically, but in a backward direction. This results in excessive force being applied to the U-frame and the U-frame may be bent. A different method of lifting the front shield is desirable. Figures 6 and 7 show a different arrangement which is simple and gives better results. The new lifting device consists of a U-frame made of 3/8" x 3" steel bar which is attached to the frame of the tractor with a single bolt on each side; the U-frame pivots at these bolts. The front shield is attached to the center of the U-frame by means of a chain. A 3/8" x 3" flat bar (see Fig. 5) is bolted to the "U"; This bar is long enough to be in line with the lifting lever and the lifting arm of the rear lifting device. The end of the bar is bent 90 degrees and a $\frac{1}{2}$-inch hole bored in the end. A $\frac{1}{2}$-inch round rod from this hole to similar hole in the rear lifting arm connects the front and rear lifting mechanisms so that the front and rear shields are lifted simultaneously when the lever is manipulated.

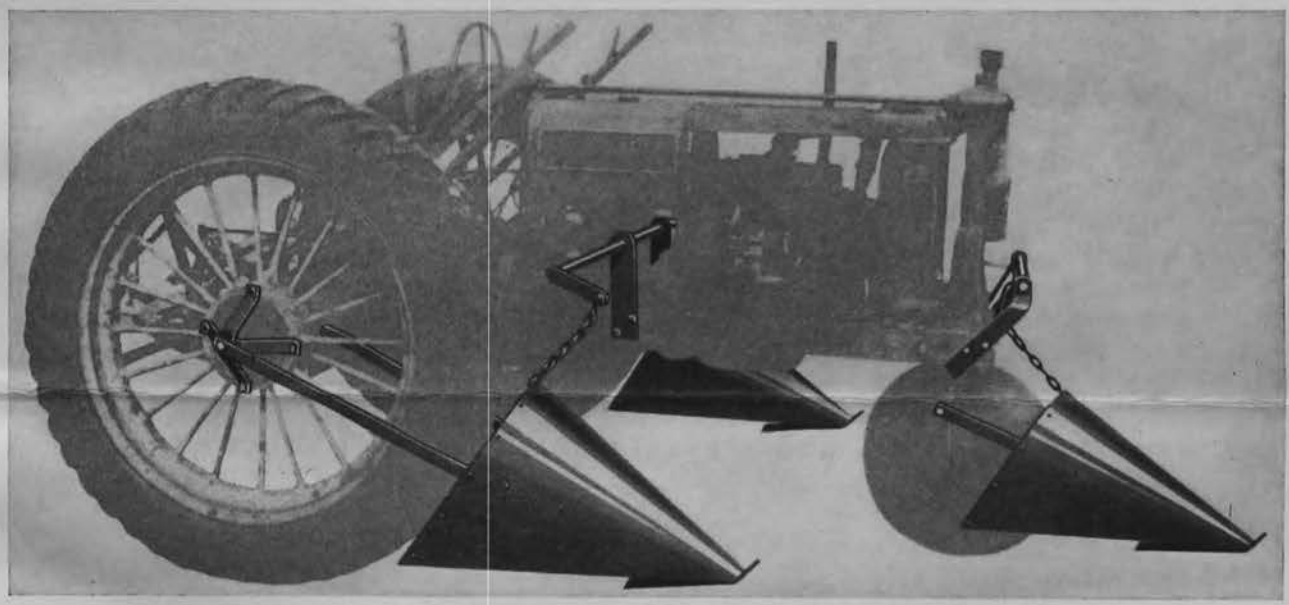

Fig. 1—"A Home-made Potato Vine Lifter Mounted on a Tractor"

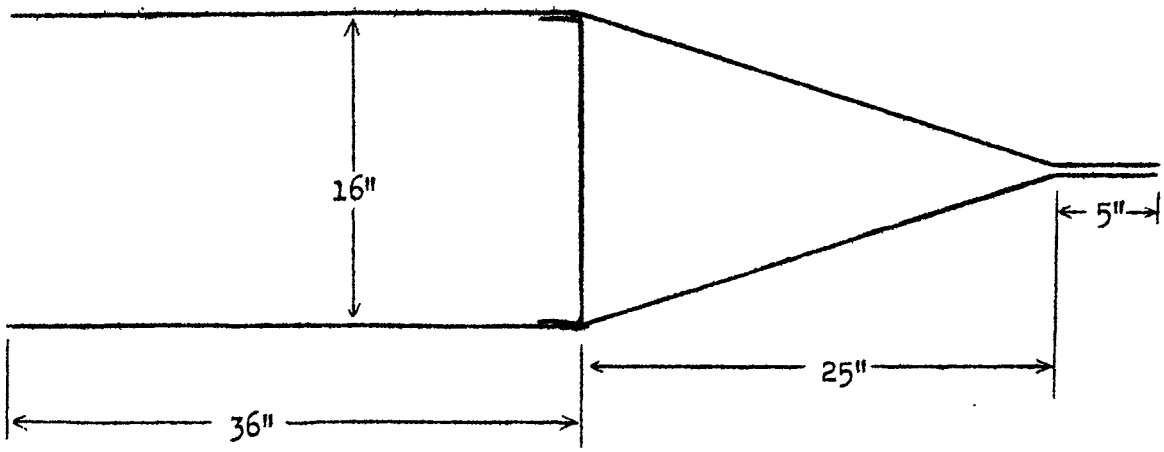

Fig. 2. Side bars and brace for rear wheel. (3/8" x 1½" flat iron bar)

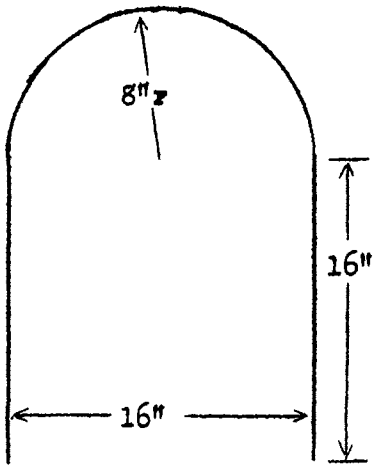

Fig. 3. Brace for rear wheel shield
(¼" x 1½" flat iron bar)

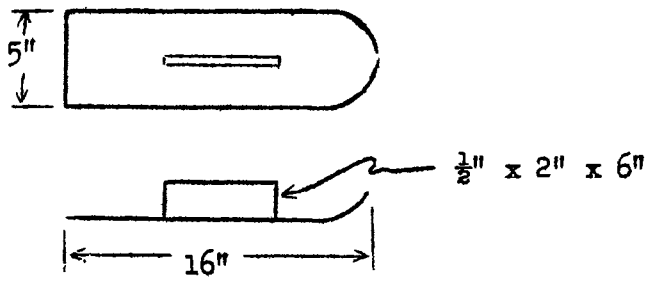

Fig. 4. Shoe. (1/8" x 5" x 16")

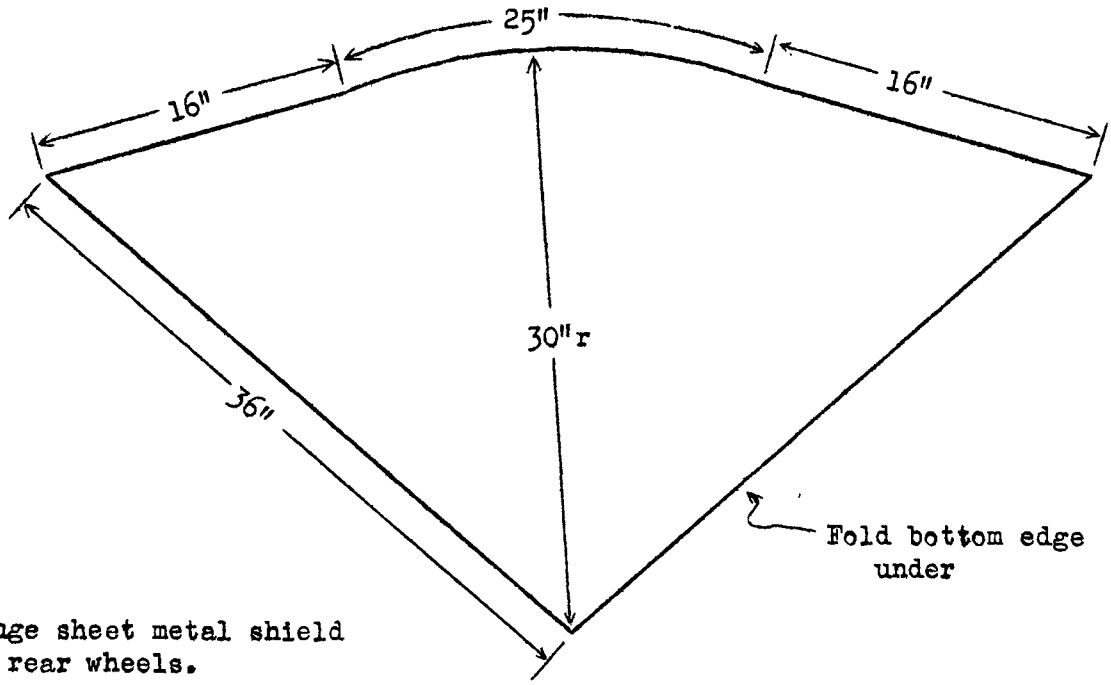

Fig. 5. 22 gauge sheet metal shield
for rear wheels.

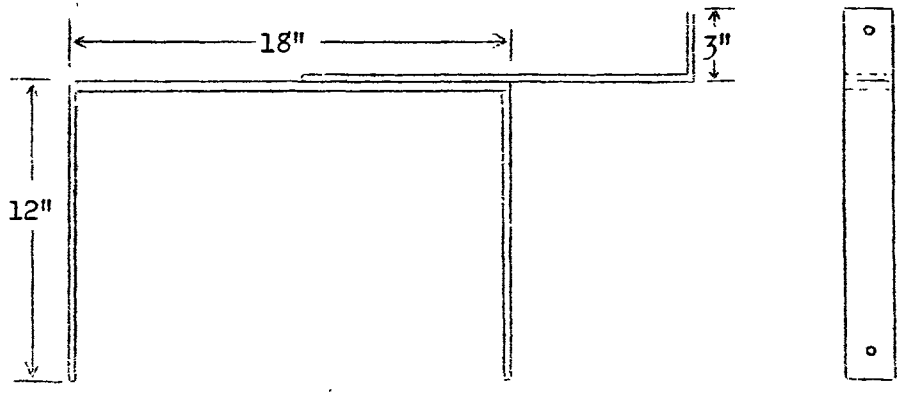

Fig. 6. Front and side view of U-frame for the front shield lifting mechanism. The U-frame and bracket are made of 3" x 3/8" flat steel.

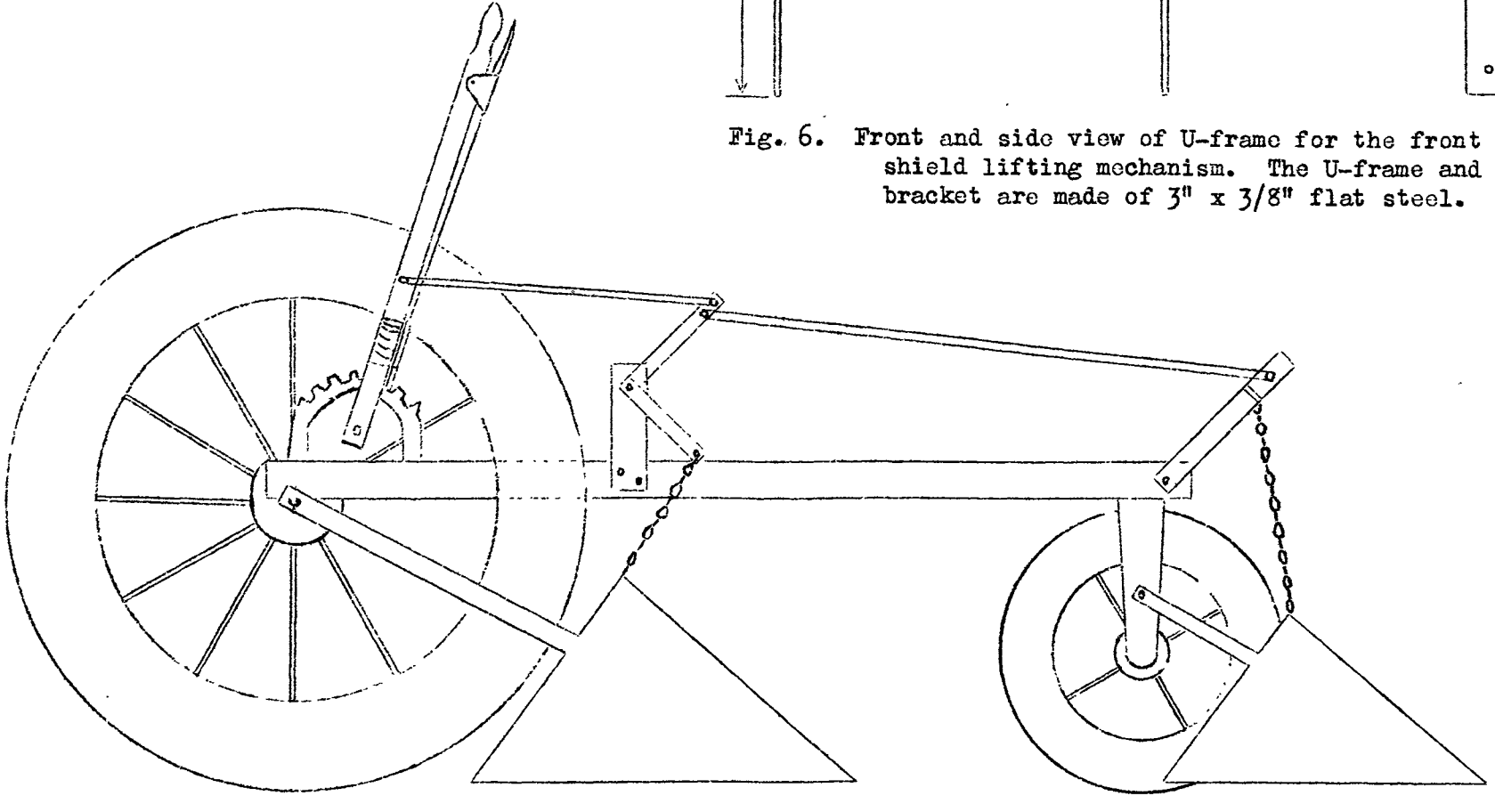

Fig. 7. Schematic diagram showing the method of lifting the shields.